15¢

TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

SEP 27 1944

DETROIT

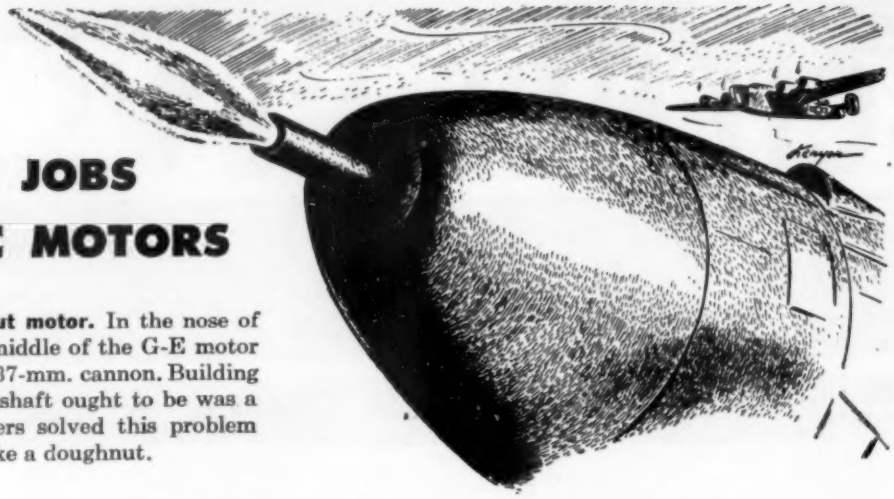
THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 23, 1944

Triplets

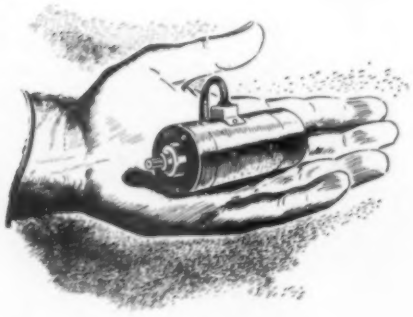
See Page 200

A SCIENCE SERVICE PUBLICATION

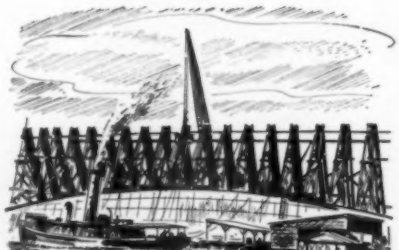
STRANGE JOBS FOR ELECTRIC MOTORS



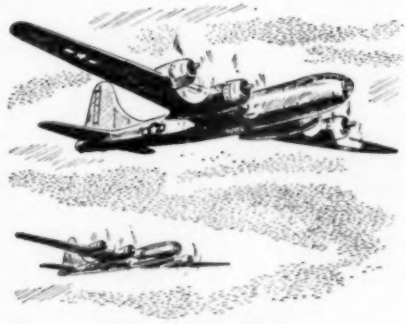
Cannon shoots through doughnut motor. In the nose of this fighter plane, right in the middle of the G-E motor that feathers the propeller, is a 37-mm. cannon. Building a motor with a hole where the shaft ought to be was a brain twister, but G-E engineers solved this problem with an electric motor shaped like a doughnut.



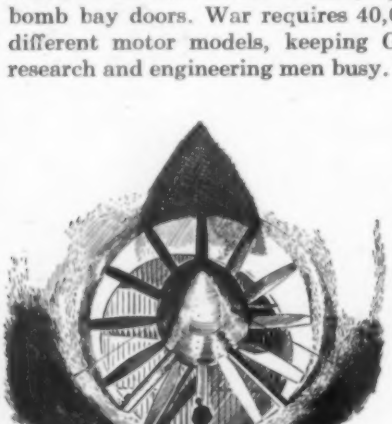
This Tom Thumb motor loads the guns on our bombers and fighters. Other electric motors raise and lower wheels, open bomb bay doors. War requires 40,000 different motor models, keeping G-E research and engineering men busy.



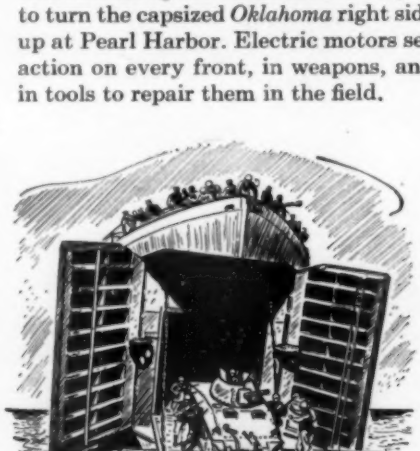
Turning a battleship over. 21 G-E motors teamed up for 21-thousand-ton pull to turn the capsized *Oklahoma* right side up at Pearl Harbor. Electric motors see action on every front, in weapons, and in tools to repair them in the field.



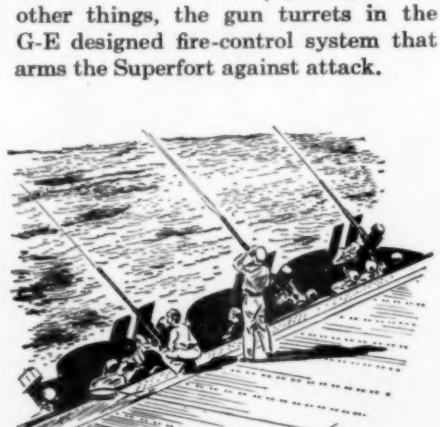
B-29 Superfortress. 150 electric motors act as muscles beneath the sleek exterior of the B-29. They power, among other things, the gun turrets in the G-E designed fire-control system that arms the Superfort against attack.



Outblowing a hurricane. This twelve-bladed fan has 18,000 horsepower behind it, from one giant electric motor. In wind tunnels like this, G-E motors, sometimes totalling 30,000 hp., produce winds five times as strong as a hurricane.



Push-button doormen for LST's. Push a button, and out pops a tank. It's not quite that simple, but the doors and ramp on an LST are opened, at the push of a button, by electric motors. On an LST, there are 140 electric motors.



Cooling guns. Anti-aircraft guns are cooled by electrically driven pumps which circulate cooling fluid around their barrels. There are more than 900 electric motors on a battleship. *General Electric Company, Schenectady, N. Y.*

- *General Electric produced 7 million horsepower of electric motors in 1943.*
- *Over 2 million G-E electric motors will join the armed services this year.*

FOR VICTORY—BUY AND HOLD WAR BONDS

GENERAL ELECTRIC

952-618-211

Hear the General Electric radio programs: "The G-E All-girl Orchestra," Sunday 10 p.m. EWT, NBC—"The World Today" news, every weekday 6:45 p.m. EWT, CBS.

MEDICINE

Bone Disease Treatment

Penicillin has been found effective for osteomyelitis in experiments on laboratory rats, the bones healing with no trace of infection.

➤ PENICILLIN was found effective in the treatment of osteomyelitis, one of the most serious of bone diseases, in experiments on laboratory rats reported by Dr. J. Emerson Kempf and Dr. J. Arthur Herrick of the University of Michigan School of Medicine before the meeting of the American Association for the Advancement of Science in Cleveland.

Very heavy doses of penicillin were injected at frequent intervals into rats in which the bone disease was present in virulent form; other afflicted rats were left untreated, as controls. Most of the treated rats showed marked improvement, and eventually their bones healed with no evidence of remaining infection. All but two untreated rats got no better, and some of them grew worse.

Science News Letter, September 23, 1944

Preservative Affects Vaccine

➤ VALUE of the new influenza virus vaccine, if kept for any length of time, is definitely affected by the kind of preservative used in it, experiments reported by Dr. H. M. Powell of the Lilly Research Laboratories, Indianapolis, indicate. The vaccine was prepared in 10-day incubated eggs, by a procedure that has now become standard. Merthiolate, formalin, strong salt solution, and phenol were the preservatives used.

After being kept in an incubator at approximately body heat for a week, all the lots except the ones containing phenol were found to be still of satisfactory strength. The phenol-preserved vaccine had lost half its potency. After an additional week of incubation the vaccine containing phenol had very weak action, while the other lots were still in useful condition. The indication, therefore, is that phenol is not a satisfactory preservative for this type of vaccine.

Science News Letter, September 23, 1944

Ultraviolet-Rayed Sausage

➤ GET SET for ultraviolet-rayed sausage, the hearty breakfast dish with vitamin value. Dr. Edgar P. Jones and Joshua Stampfer of the University of Akron reported success in curing rickets in laboratory rats with pork sausage that had been irradiated with ultraviolet. The cure was rapid, too: in six days the animals' bones had healed. Similarly afflicted rats that got no sausage to eat, and others that got sausage without benefit of ultraviolet, remained rachitic.

Science News Letter, September 23, 1944

Athlete's Foot Serious

➤ ATHLETE'S foot is a serious military problem in the South Pacific war theater, Prof. Fred D. Weidman of the University of Pennsylvania told members of the Mycological Society of America. It causes swelling and eczema-like inflammation of the feet, and sometimes loss of skin from the soles. It may also spread to the hands. Among service men in the United States, it is the second most serious disease of the skin, as measured by the number of cases admitted to hospitals.

Athlete's foot is caused by a fungus infection. Any one of several species may be active, including one yeastlike form. The fungi are very tough and long-lived; it has been found living and ready to go on growing in dry bits of skin that had been shed 433 days before.

Easy to get and hard to cure, ath'ete's foot is a sometimes annoying, sometimes disabling but never fatal malady. It limits itself almost altogether to the skin, occasionally involving also lymphatic tissue, but never eating down into the flesh or entering the blood stream.

Science News Letter, September 23, 1944

Planes Fitted to Humans

➤ AVIATION engineers and physiologists are getting together, to make modern high-performance aircraft safer and more efficient mechanisms by taking into account the capabilities and limitations of the human body, Dr. D. W. Bronk, of the University of Pennsylvania, told the meeting. The organs and senses of human beings were not evolved for the stresses, speeds and other demands made upon them in present-day flying; gadgets and instruments installed in the planes are designed to serve as extensions of the humans' parts, to enable them to meet these demands.

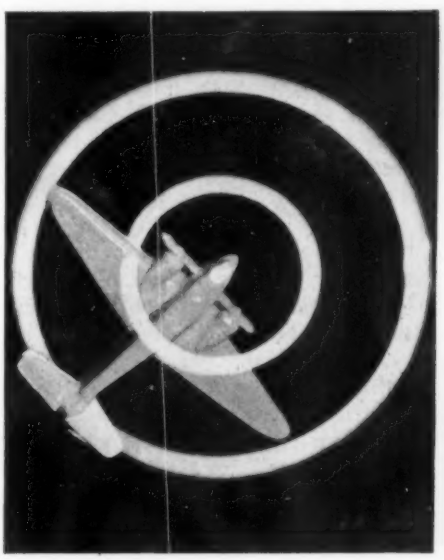
As specific examples, Dr. Bronk mentioned a new oxygen-supplying valve, which turns on the oxygen when the wearer begins to breathe hard, and shuts it off again when breathing returns to normal; and the various instruments in the cockpit that tell him when the plane is actually wrong side up, when sudden turns and steep banks have confused the flyer's ordinary senses.

Science News Letter, September 23, 1944

Addiction a Disease

➤ ACCEPTANCE by local communities of more responsibility for the problems of alcoholic addiction was called for by Dr. A. J. Carlson, of the University of Chicago. At present, he pointed out, our towns and cities act entirely on the assumption that drunkenness is a sin and a crime, and have facilities only for punishment. They do not take into account the possibility that it may be at least partly a disease, and so do not provide means for treatment.

Dr. Carlson also decried the over-emotional approach that has dominated temperance instruction in the schools, with



CLEAR VIEW—Here is what a gunner sees when he aims at an enemy plane through a sight equipped with a new Westinghouse gunsight lamp. The sight lines stand out bright and clear, making it possible to fire accurately even while aiming directly into the sun. Without this lamp the gunner could not aim within about 15 degrees of the sun, thus leaving a dreaded blind spot from which the enemy could dive to attack.

resulting falsifications of fact which children soon detect, and thereafter become hardboiled little skeptics. Stricter adherence to factual truth, he declared, will have better permanent results in the end.

Science News Letter, September 23, 1944

Ducks Have Malaria

➤ DUCKS sick with malaria of the type that attacks birds showed symptoms of the same kind that are found in seriously ill human malaria patients, a motion picture film displayed before the meeting by Dr. D. E. Fletcher and Dr. R. H. Rigdon, of the University of Arkansas School of Medicine, demonstrated. They could not stand or walk straight, the muscles were weak and incoordinated, and the birds showed little inclination to move. In general, the symptoms were those of injury to the forebrain.

On dissecting the brain after death, such brain injury was found. Certain important nerve cells were greatly impaired, or had even vanished. Similar injuries have been found in the brain of a child that had died of the most severe form of malaria, and also of monkeys experimentally inoculated with malaria.

Science News Letter, September 23, 1944

NUTRITION

Higher Vitamin Content

Vegetables, fruits, cereal foods, and even meat can be made richer in vitamins if nutritionists say the word and point the way to scientists.

➤ VEGETABLES, fruits, cereal foods, such as wheat for bread, and even meat can be made richer in vitamins and other nourishing qualities if nutritionists say the word and point the way to agricultural scientists, Dr. R. J. Garber, director of the U. S. Department of Agriculture's Regional Pasture Research Laboratory at State College, Pa., told members of the American Association for the Advancement of Science, meeting in Cleveland.

Already a way has been found to breed sweet potatoes with a higher content of carotene, the chemical from which human bodies make vitamin A. A variety of snap beans and two varieties of cabbage with more vitamin C in them than commercial varieties of these vegetables have been developed.

Discovery of differences in the amount of thiamin, better known as vitamin B_1, between varieties of wheat suggests, Dr. Garber said, that it may be possible by breeding to produce a wheat with more of this vitamin than any now commonly grown.

It may even be possible, he said, to change by breeding the relative thiamin content of different parts of the wheat kernel. This means that fine white flour for bread could be obtained without milling out the vitamin and having to put it back into the flour or bread as is done under the present enrichment program. Minerals, such as iron, copper, calcium and the like, can be increased in plant foods by increasing the amounts of these minerals in the soil. Some plants, however, may inherit better ability to pick up minerals from the soil than others. This suggests that the plant breeder might develop varieties of plant foods that would supply more minerals as well as more vitamins.

Only a beginning has been made along these lines, Dr. Garber said, but the way is open for great future progress similar to the strides plant breeders have already made in developing fruits, vegetables and grains that are bigger, more attractive looking, better tasting, more productive and more resistant to disease.

Science News Letter, September 23, 1944

Incubator Plants

➤ INCUBATOR babies now have their equivalents in the plant world, it was disclosed at the meeting by Dr. Albert F. Blakeslee of the Smith College genetics experiment station. They are tiny plant embryos, too feeble to sprout from the seeds in which they are formed, or even to produce their own roots when they are helped out artifically, but scientifically so valuable that special efforts to make them live and grow are worth while.

Very carefully dissected out of the seeds with keen but delicate instruments manipulated under a microscope, the minute plantlets are lifted onto a bed of gelatine-like material containing necessary nutrients and carefully kept free of disease germs and fungi. Some of the little plants are too weak to produce roots even with this ultra-careful nursing. For such, a second operation has been provided: micrografting, which supplies roots from a healthy plant that will take hold of the feeble scions and feed them into normal growth.

Drying out is another danger which these botanical incubator babies must face. To prevent this, the weak but hopeful infants are kept inside ordinary gelatine medical capsules, that serve as microgreenhouses.

Naturally, extreme care of this kind is provided only for a few premature infant plants. Thus far, they have been of hybrids produced by crossing plants rath-

SCIENCE NEWS LETTER
Vol. 46 SEPTEMBER 23, 1944 *No. 13*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

Copyright, 1944, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, American Philosophical Society; Otis W. Caldwell, Boyce Thompson Institute for Plant Research; Henry B. Ward, University of Illinois. *Nominated by the National Academy of Sciences:* Harlow Shapley, Harvard College Observatory; Warren H. Lewis, Wistar Institute; R. A. Millikan, California Institute of Technology. *Nominated by the National Research Council:* C. G. Abbot, Smithsonian Institution; Hugh S. Taylor, Princeton University; Ross G. Harrison, Yale University. *Nominated by the Journalistic Profession:* A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. *Nominated by the E. W. Scripps Estate:* Max B. Cook, Scripps Howard Newspapers; H. L. Smithton, Executive Agent of E. W. Scripps Trust; Frank R. Ford, Evansville Press.

Officers—President: Edwin G. Conklin. *Vice President and Chairman of Executive Committee:* Harlow Shapley. *Treasurer:* O. W. Riegel. *Secretary:* Watson Davis.

Staff—Director: Watson Davis. *Writers:* Frank Thone, Jane Stafford, Marjorie Van de Water, A. C. Monahan, Martha G. Morrow. *Science Clubs of America:* Joseph H. Kraus, Margaret E. Patterson. *Photography:* Fremont Davis. *Sales and Advertising:* Hallie Jenkins.

er distantly related, which cannot be induced to form seeds that will be viable by ordinary growing methods, but which give promise of yielding important botanical information if they will only live.

Science News Letter, September 23, 1944

Roots Commit Suicide

➤ ROOTS of plants can poison themselves with the carbon dioxide formed by their own life processes, unless there is some way for this gas to be removed. Dr. H. T. Chang and Prof. W. E. Loomis of Iowa State College told the American Society of Plant Physiologists of experiments in which they demonstrated that in the presence of toxic concentrations of carbon dioxide, roots first failed to absorb water and mineral nutrients, particularly potassium and nitrogen, and finally died. Too high a concentration of the gas proved fatal even to swamp plants like rice.

Science News Letter, September 23, 1944

Cork Isn't Waterproof

➤ CORK isn't completely waterproof, no matter how good it is for stoppering bottles and floating life rafts. When a plant's roots are thirsty enough they can pull water right through the thin layer of cork that covers all but the youngest of them, Dr. Paul J. Kramer of Duke University discovered through experiments.

The thinnest and most delicate portion of a root is its almost microscopically slender tip. This is the only portion that is not cork-sheathed, and for this reason it has long been assumed that water was absorbed only through root tips, or the zone just back of them.

However, when Dr. Kramer attached sensitive instruments showing water absorption rates to the older, corkier parts of the roots of both evergreen and broad-leaved trees, he found that water went through, in small but positively measurable quantities. He was able to show water absorption through the cork layer also when he substituted artificial suction for the natural pull of the tree's transpiring leaves.

Science News Letter, September 23, 1944

Magnesium was first produced commercially in the United States in 1915 when the war cut off the former German supply; domestic production was started for the Army for use in tracer bullets, star shells, flares and flashlight powders.

Government restrictions on *zinc sheet* for use in making printing plates have been relaxed, and plate-makers may use this metal at the 1941 rate.

GENERAL SCIENCE

Postwar Shortage

Even after fighting ends, it will be years before graduate students come from undergraduate classes. Plan offered to speed professional training.

➤ A PLAN for meeting the acute postwar shortage of trained professional men by an accelerated program of graduate study was outlined before the American Psychological Association meeting in Cleveland by Prof. Sidney L. Pressey, of the Ohio State University.

In the college year 1942-43 the number granted advanced degrees in U. S. institutions of higher learning dropped 30% from the 25,000 who received graduate training the year before, Prof. Pressey said. Soon afterwards some graduate schools were reporting that "the graduate student is practically extinct." It is estimated that even after the war is over, it will take three or four years before the normal flow of students from undergraduate colleges to graduate work is reestablished.

In addition to the acute need for professionally trained persons, demand for acceleration of graduate programs will come from returning service men, already mature and experienced in positions of authority who want their degrees without further delay, Prof. Pressey predicts.

Graduate training needs overhauling, anyway, Prof. Pressey believes. It is just about as it was imported from Germany about 80 years ago and put on top of an entirely different and longer system of earlier education. Before the war in Germany, the average age for receiving a doctor's degree was 24. In the United States it was 30—an age when some of the most creative years and the prime of life, physically, are already past.

First change that Prof. Pressey would make in the graduate program would be to admit students to graduate study on the basis of ability rather than previous degrees. He would count relevant war or work experience in the assessment of ability.

Then, he would find out experimentally just what kinds of work persons with graduate degrees actually do, and plan the curriculum to fit them for those specific duties. We should get away, he said, from the feeling that actual doing of a particular type of professional work is relatively unimportant if only there have been enough courses and readings about it. He would increase the internships.

He would do away with the final oral examination as the main criterion for granting a degree. It is, he said, literally a heritage from the middle ages. It should be kept, but its role would be supplementary. The student's work in internships as well as class would be considered as well as abilities and personality.

The graduate programs would improve rapidly, Prof. Pressey suggests, if graduate students were given more hand in things. At present they have less to say about policy than do undergraduates in many colleges or even students in high schools. Real participation by students would bring invaluable help in understanding and dealing with student problems, especially those of veterans.

Finally, Prof. Pressey urged that his colleagues act more like scientists and less like lawyers in putting into effect reforms in the graduate training. Try new things, experimentally, he recommended, and see how they work.

Science News Letter, September 23, 1944

MILITARY SCIENCE

Grasshopper Planes Now Lay Telephone Wires

➤ GRASSHOPPER planes, the little flying jeeps that carry observers for spotting artillery fire, have taken on a new job. Flying low and slow—height about 200 feet, speed 65 to 70 miles an hour—they quickly lay telephone wire from forward observation posts on the ground back to the gun positions.

Two artillery officers, Capt. Richard Leffers and Lt. George W. Maddox, tell how it is done (*Field Artillery Journal*, September).

Most critical task in preparing to lay wire from the air is the winding of the wire in rolls from which it can be pulled rapidly without jerking or kinking, which would cause breaks. These rolls are spliced into a series, which rides end to end in a cylindrical container lashed to the wing struts, close to the fuselage. Telephone instruments are dropped on small parachutes.

Science News Letter, September 23, 1944

GENERAL SCIENCE

Nation Needs Research

And future of science in United States will be determined by our educational policy. Trained men are limiting factors. National scholarship program urged.

➤ "IN EVERY section of the entire area where the word science may be properly applied, the limiting factor is a human one. We shall have rapid or slow advance in this direction or in that depending on the number of really first class men who are engaged in the work in question. . . . . The future of science in this country will be determined by our basic educational policy," declared Dr. James B. Conant, president of Harvard University and chairman of the National Defense Research Committee, speaking at the meeting of the American Chemical Society, in his address of acceptance of the Priestley medal of the Society, awarded him for his outstanding work with the council and, in association with Bernard M. Baruch, for the early wartime study of the American rubber situation.

"There are few who doubt," he said, "that both the future security of the country from a military standpoint and our continued prosperity as an industrial nation are closely linked with the proper support of scientific research and technical development."

"I am going to be bold enough," he added, "to make a specific suggestion . . . that the federal government institute a national scholarship program for young men who give promise of becoming leaders in science and technology."

Dr. Conant would have these scholarships given to high-school graduates through non-political committees in each state. They would include support on a modest basis through four to seven years of further education.

Recipients of these scholarships would agree, in return for the opportunity thus provided, to make themselves available in time of national emergencies for national service under whatever conditions the government should then set.

There are persons in this country who feel that drastic changes must be made in the organization of applied science, the speaker stated, in the direction of more centralized control, more planning, and more direct intervention by the government.

"It would be my contention," he added, "that experience demonstrates that for the most effective scientific advance in the applied fields one must have keen rivalry and competition between a number of strong and independent groups. In each industry one might hope that at least half a dozen industrial laboratories would be carrying forward competitive lines of research and development."

Dr. Conant warned industrial laboratories against the danger of their picking off for their work valuable men on university research and teaching staffs. "Remember that you are dealing in your laboratories with the application of science; you must look to the universities for the fundamental advances which you later are to apply. Secondly, you must each year look to the universities for trained men. Therefore, if you raid the university staffs and pick off the promising young professors for your work, you are endangering your greatest assets."

Science News Letter, September 23, 1944

Young Men Needed

➤ "FOR GENIUS and display, take youth; for cold calculation and planned execution, take age." This is the conclusion of Dr. Thomas Midgley, Jr., president of the American Chemical Society, in his presidential address at the 108th meeting of the Society.

Dr. Midgley is vice president of Ethyl Corporation. His theme was the need of young men in science research and their necessity as shown by a recent study of the age factor in discovery and invention.

"The extension of life, resulting from the applications of those principles regarding disease, developed nearly a century ago, has produced a condition in society whereby too many men are being kept in service beyond the years when previously they would have been eliminated." Dr. Midgley said, "This is particularly true in those activities requiring originality for scientific progress. Their retention is denying advancement to younger men at the very age when these younger men may be expected to be entering those years when their maximum efficiency will be attained."

As evidence of youth's greater creativeness, Dr. Midgley cited an unpublished Patent Office table of important inventions, ranging from the steam engine by Watt to the airplane by the Wrights.

Of these inventions, 85 in number, 46 were by men 35 years old or less, 58 were by men under 40 years. Many of the inventions were by young men in their twenties. Most of those by men over 40 were men who had not yet reached their fiftieth birthday.

Dr. Midgley explained that he does not mean that men over 40 are of no use to society, for, he said, "it is too evident that they are. But their usefulness is distinctly of a different nature from the usefulness of youth. Youth is original and creative, while age is simply experienced. Both are essential elements on any team that is to make for lasting progress. I am not complaining that we have old men in active service; but I do complain about having old men in young men's places."

Science News Letter, September 23, 1944

ECONOMICS

Seven-Point Program for Full Employment Offered

➤ FULL employment after the war was blueprinted before the meeting of the American Association for the Advancement of Science by a Washington economist, Dr. Joseph Mayer of the Brookings Institution. His program points include:

1. Establishment of a Reconstruction Employment Commission, set up by Act of Congress and reporting its findings to the President, Congress and the people, with existing agencies entrusted with the execution of its plans.

2. Immediate attack by this Commission on two problems: re-employment of workers displaced during reconversion, and temporary maintenance of the unemployed.

3. Investigation of the adequacy of existing arrangements for demobilization of the armed forces.

4. Obtaining of a clear public statement of postwar domestic policy, especially as regards time of terminating war contracts, relations between government and private enterprise, proposed government fiscal programs, and assumption of responsibility by leaders of labor, business and agriculture.

5. Studies of relations between government and business, particularly on factors making for violent fluctuations between booms and depressions.

6. Adjustment of taxation to give maximum encouragement to venture capital.

7. Encouragement of cooperative planning between labor and business, including agriculture.

Science News Letter, September 23, 1944

ENGINEERING

Tiny Tools for War

So small that they are used only under powerful microscopes, miniature hammers and chisels are helping to build mighty engines of war.

➤ HAMMERS, chisels, saws, tweezers and other tools, so small that they can be used only under powerful microscopes, are playing a mighty part in the war in helping to build and improve gigantic engines for Flying Fortresses and hundreds of other heavy articles of equipment.

The new science of micrurgy, the use of these tiny tools under the microscope, was discussed at the meeting of the American Chemical Society by Dr. George F. Hand of the Fairchild Engine and Airplane Corporation. The tools are moved in use by a mechanical device known as a micromanipulator, operation of which may be learned quickly and easily.

The thimble laboratory, as Dr. Hand calls the collection of tiny tools, has dozens of advantages, among them speed and shortcuts, saving of space and time, use of such minute amounts that rare and costly chemicals can be used, extreme safety in hazardous tests, and savings in personnel and costs. Odors, explosions, poisoning, fires, and acid burns on clothes are practically eliminated.

As an example of a few of the jobs done with these thimble laboratories which are only pocket-size, Dr. Hand said, "Studying rust-proof protection for airplanes flying in tropical dampness, a chisel only 10 by 30 microns in size can dig out an infinitesimal piece of rust. Tiny tweezers handle the rust particles while hammers, saws, and magnets take it apart, and science learns some new information."

Particles of fine desert dust are sorted out with micron pointers, rakes, and o her tools and tested for size, static changes, and chemical nature.

Science News Letter, September 23, 1944

Pinhead of Blood

Some blood tests, speedy and life-saving, can now be made by chemistry under the microscope with only a pinhead of blood, and science can look forward to the day when a complete analysis of many components can be made with only one drop of blood, declared Dr. Albert E. Sobel of the Jewish Hospital of Brooklyn.

It has long been known that the chemical composition of blood changes in disease. With older methods of analysis relatively large samples of blood were necessary. Microchemistry for medical use has now been developed to this present stage of "ultramicrochemistry" where samples ranging from the size of a pinhead to that of a rain drop are all that are required.

These steps have been made possible, Dr. Sobel said, by such developments as the capillary microburet, which measures extremely small amounts of liquids accurately; the photo-electric colorimeter, which uses light of almost one pure color to detect minute changes in color, and more sensitive dyes to indicate the end of chemical reaction.

Science News Letter, September 23, 1944

MILITARY SCIENCE

Soldier's Pack Lighter Than When War Began

➤ THE INDIVIDUAL soldier today carries 15 pounds less in clothing and equipment than he did in 1941, the War Department has announced. This means that about 100 tons less material is moved with the average infantry division, releasing valuable cargo and truck space.

In reducing the total load from 110 pounds to 95 pounds, experts of the Quartermaster Corps lessened the number of items carried and cut the weight of some of the individual items. This was done by redesigning them or substituting lighter material, or both.

A soldier embarking for overseas now boards the ship wearing clothing and equipment weighing approximately 18.5 pounds. He carries a 45-pound pack, including rifle, sleeping bag, gas mask, and medical supplies. and a duffle bag weighing from 25 to 35 pounds—depending on his destination and personal effects.

Instead of having to take a complete issue of all authorized clothing and equipment, the soldier may leave certain essential items which are used only occasionally to be shipped in bulk to overseas depots. Items authorized for issue are now divided into two classes, mandatory and discretionary. The first group includes clothing and equipment worn by the soldier, carried in his pack or in his duffle bag. The second category includes items to be issued by the Quartermaster Corps on specific requisition by theater commanders.

Science News Letter, September 23, 1944

STABILIZERS—The girls in this General Electric laboratory are giving a final inspection to gyroscopes before they are sent to the Army and Navy for use as balancers while planes are in flight.

BACTERIOLOGY

Germs May Be Means For More Abundant Living

➤ GERMS, which most of us automatically associate with disease and death, are becoming the means for more abundant living, Prof. R. E. Buchanan of Iowa State College declared in an address before the meeting of the American Association for the Advancement of Science.

New discoveries in bacterial beneficence are being made in a score of fronts in the nutritional field, Prof. Buchanan indicated. It has been found, for example, that microorganisms in the cow's stomach not only aid in the digestion of the fodder she eats but are able to take over compounds of nitrogen hitherto considered no good for animal food, and convert them into materials which the cow in turn synthesizes into milk and meat. As much as a fifth of the cow's protein production can be taken care of in this way, the speaker said.

Friendly germs, producing compounds related to penicillin, may prove the salvation of some of our crop plants from fungus diseases, Prof. Buchanan continued. The whole new technique of antibiotics, of which penicillin use is just one special case, is based on the chemical enmity that exists between germ and germ, mold and mold, he pointed out; and there is good reason to expect that we can take advantage of this for the protection of our plants as well as our farm animals and ourselves.

Science News Letter, September 23, 1944

ZOOLOGY

Fork-Tailed Lizards Are Perfectly Normal

➤ IF YOU see a lizard with a forked tail, or a chameleon with a green body and a brown tail, don't blame it on unpedigreed wartime beverages. The little reptiles are perfectly normal; they've only had the misfortune to lose parts of their tails and have grown new ones. Some of the color changes to be found in lizards with regrown tails have been described by Prof. F. H. Wilson of Tulane University. His particular pet is the little lizard commonly known as the American chameleon, a common species along the Gulf Coast. Zoologists call it *Anolis carolinensis*.

Like many other lizards, it can break off its tail, at definite segmenting points, if it is grabbed by a hungry bird or beast. It loses its tail but saves its life. Then it grows a new tail.

Sometimes the stimulus to grow a new tail comes at two spots on the stump of the old one. It is then that a forked tail develops.

The chameleon can change its color, from green to brown and vice versa, to blend itself into its background and so possibly escape greedy attention. But after it has grown a new tail it is unable for a time to change its color from green to brown. "It is an amazing sight," Prof. Wilson commented, "to see a green lizard running around with a brown tail."

Science News Letter, September 23, 1944

CHEMISTRY

Use of Lye Now Speeds Peeling of Potatoes

➤ POTATOES can be peeled at the rate of more than 18,000 pounds per hour when lye is used to do the job, A. H. Copeland, Jr., R. M. Chatters and R. D. Kerwin, of the research laboratories of the Diamond Alkali Company at Painesville, Ohio, reported at the meeting of the American Chemical Society.

The lye peeling method is now being widely used for other vegetables and fruit for the armed services. Besides the saving in labor, new medicinals, plastic ingredients and valuable oils have been discovered in peels and seeds hitherto wasted.

Science News Letter, September 23, 1944

CHEMISTRY

Chlorine Dioxide Purifies Public Drinking Water

➤ THE removal of tastes and odors in public water supply systems caused by industrial wastes may now be accomplished in a new process in which chlorine dioxide is used, Dr. G. P. Vincent of the Mathieson Alkali Works told the American Chemical Society meeting.

The water, he said, is first treated with chlorine to kill germs, and then with chlorine dioxide to remove chlorphenol taste and odor. In tests by the Niagara Falls, N. Y., water department, it was demonstrated over a period of several months that water too contaminated for the usual chlorine treatment was successfully purified by the new process.

The chlorine dioxide is made by treating sodium chlorite with chlorine water, using the customary chlorinating apparatus at the filter plant. It is claimed that the new process is not only much more efficient than ordinary chlorination, but is also more economical and simpler to operate.

Science News Letter, September 23, 1944

IN SCIEN

ZOOLOGY

Three Bengal Tiger Cubs Born at Washington Zoo

See Front Cover

➤ THE TINY Bengal tiger cubs shown on the front cover of this SCIENCE NEWS LETTER were born on August 28 at the National Zoological Park in Washington, D. C. When Fremont Davis, Science Service staff photographer, took the picture, the cubs were exactly one week old. They weighed between three and one-half and four pounds apiece at birth. The mother tiger had to be removed before this picture was taken. Litters usually run from one to five babies, so these three make a nice-sized family. The triplets are doing nicely and the mother is taking considerable interest in her babies. This is the first time that she has had a proper maternal solicitude for her family.

Science News Letter, September 23, 1944

CHEMISTRY

Quantity of Methane Shows Constitution of Coal

➤ BY STUDYING the quantity of methane, a major constituent of coal gas, evolved on carbonization of a wide variety of coals, a new approach to the constitution of coal has been discovered, declared Dr. Corliss R. Kinney of the Pennsylvania State College at the division of Gas and Fuel Chemistry of the American Chemical Society meeting.

Very little is known about the chemical constitution of coal, he said, in spite of its tremendous importance, not only as a source of heat and power, but also as a vast storehouse of organic chemicals.

"A comparison of the yields of methane from coal, as well as from peat, the first step in the formation of coal, with those from cellulose, the pentosans, and lignin, the main components of the vegetation from which peat and coal are made," he said, "indicates that lignin is responsible for the characteristic methane yielding property of coal. From this it appears that the constitution of coal is related to the structure of lignin. The coalification process is chemically a process of deoxygenation and does not affect the methane yielding carbon skeleton."

Science News Letter, September 23, 1944

NE FIELDS

PUBLIC HEALTH

Polio has Declined Throughout Nation

➤ INFANTILE paralysis cases declined throughout the nation during the week ending Sept. 9, latest on which figures are available. From the figures reported to the U. S. Public Health Service, it appears that the worst of the epidemic may be over. This is the first week to show a decrease in cases since the outbreak started early in the summer in North Carolina.

The total for the week, exclusive of Nebraska, was 1,487. Nebraska reported seven cases the previous week, so the figure from that state will probably not change the total very much. The previous week's total was over 1,690.

Almost all states reported a drop in cases. In Massachusetts, Illinois, Delaware, Minnesota, Iowa, and West Virginia the trend still was upward.

Science News Letter, September 23, 1944

CHEMISTRY

Waste of Our Corn Crop Could Produce Alcohol

➤ SEVENTY million tons of wasted corn fodder or stover growth each year with America's corn grain could supply the nation with great quantities of industrial alcohol and fiber for the production of paper, declared Dr. H. C. Gore of New York City, at the meeting of the American Chemical Society.

It can be readily shown, he said, that at harvest time, corn stalks, composing about 40% on the dry weight of the stover, contain in many instances 25% upwards of readily fermentable sugar, and 30% and over of fiber of excellent quality for use in making paper and paper products.

It is found, he continued, that the method of analysis used in the study of sugar cane and sorghum cane fit very well in the analysis of corn stalks.

Methods have been developed for reducing the stalks to a finely shredded condition from which the juice can be readily obtained by pressing.

Corn stalk juice has a grassy taste, he stated, and throws out a heavy green coagulum when heated. It will yield an excellent cooking syrup upon evaporation. It could be readily produced in great quantities either by the use of roller mills, or, as he found in his own work, by use of cane reducing machines followed by pressing by the rack and cloth method.

Science News Letter, September 23, 1944

MANUFACTURING

Commercial Standards For Silver Jewelry Proposed

➤ A COMMERCIAL standard for silver, established by the National Bureau of Standards, requires that quality marks, such as "silver," "solid silver" or "sterling silver" on jewelry and novelties made from the metal, be accompanied by the registered trademark or name of the manufacturer or seller.

The commercial standard was established so that the quality mark usage and practice might become a matter of public record and acceptance on a nation-wide basis.

Science News Letter, September 23, 1944

CHEMISTRY

Active Carbon Improves Taste of Drinking water

➤ ACTIVE CARBON, a product originally developed to protect soldiers against war gases, is now successfully used in over 1,200 public water supply systems in the United States to improve the palatability of the water by removing all tastes and odors, stated Dr. John W. Hassler, of the West Virginia Pulp and Paper Company, speaking at the American Chemical Society meeting in New York City.

The use of chlorine to disinfect water, he said, has practically eliminated typhoid fever and other water-borne diseases, but does not remove tastes and odors, and, in fact, sometimes intensifies them. The public often judges the purity and safety of a food or water by its taste and smell, and if the public water supply is not palatable will use water from a spring or well which may not always be bacteriologically safe.

The method of applying the active carbon is quite simple, he said, just add enough to remove all tastes and odors. There are occasional conditions which require special study. It has not been found practical to employ chemical methods of analysis to investigate these taste and odor problems, and ordinary odor tests are not sufficiently sensitive. A "Threshold Odor Test," developed by Charles Spaulding, enables these problems to be solved, he states, and is now used extensively.

Science News Letter, September 23, 1944

PSYCHOLOGY

Liking for Candidate Follows Decision of Vote

➤ DO YOU vote for a candidate because you like him, or do you like him because you have already made up your mind to vote for him?

Most voters would answer "yes" to the first question and "no" to the second —perhaps a little indignantly. But the probabilities are rather strong that your liking follows your voting intention, Dr. Paul F. Lazarsfeld, Columbia University psychologist, demonstrated before the meeting of the American Association for the Advancement of Science.

Dr. Lazarsfeld arrived at his conclusion after an analysis of voter preference and their changes polled during the 1940 campaign. He found that voters who disliked Willkie at the beginning, but were going to vote for him anyway, for reasons of party loyalty or other considerations, got over their grouch and declared a liking for the big Indianian when a second poll was taken later on. A similar switch in feeling occured on the part of loyal Democrats who disliked Roosevelt personally at the beginning of the campaign.

Science News Letter, September 23, 1944

ENGINEERING

Underwater Welding Used To Repair Holes in Ships

➤ PATCHING of large holes below the waterline of warships is now possible by a new method of underwater electric welding. This new method speeds up the time required to get the battleship back into action by making it unnecessary to put the ship in a drydock.

The new underwater welding process was developed by Prof. Khrenov of the Moscow Transport Electromechanical Engineering Institute. A steel plate is first cut to fit over the hole in the side of the ship. This is lowered below the waterline and welded into place with a steel electrode covered with a special waterproof grease.

The electric arc formed has a temperature of about 6,000 degrees Centigrade. This intense heat disintegrates the water into hydrogen and oxygen gases forming a continuous stream of bubbles which blanket the spot being welded, keeping the water out.

The process is being used extensively by Soviet seamen. A special technical training motion picture has been released demonstrating the new process.

Science News Letter, September 23, 1944

METEOROLOGY

Atlantic Hurricane

The recent storm that swept up the eastern coast closely resembled the tropical storm of 1938, but was higher in wind velocity.

➤ THE HURRICANE which swept up the Atlantic Coast last week resembled in many ways the tropical storm that cut a deadly path over Long Island and New England in September 1938, killing 441 persons and destroying an estimated $100,000,000 worth of property.

The Weather Bureau stated that this storm had a higher wind than the one in 1938, which caused the barometer to drop much lower as it passed up the coast.

Both storms came at the beginning of the Autumn hurricane season, which is at its height from Sept. 15 to Oct. 15. In both cases the exact origin of the storm is not known, except that they started somewhere in the Atlantic between Florida and Africa. The 1938 hurricane was first reported on Sept. 17 by radio from a ship 600 miles east-northeast of Puerto Rico. The recent storm was first reported on Friday, Sept. 8 at 4:30 p.m. by the San Juan, Puerto Rico, office of the U. S. Weather Bureau. At that time it was just east of the Lesser Antilles moving in a northwesterly direction, at a rate of 10 to 12 miles an hour.

Meteorologists watched both hurricanes approach the Atlantic coast of the United States, head toward Florida, then gradually veer northward towards Cape Hatteras, North Carolina. Both storms made this turn just north of the Bahamas, in a period lasting about 24 hours. Due to the circulation of the upper atmosphere, many hurricane winds turn northward in this general area.

The 1938 hurricane appeared to be turning again after passing Cape Hatteras at 8:30 a.m. on Sept. 21, and the meteorologists hoped that it would lose itself in the North Atlantic. Instead, its center struck Long Island at 3:30 p.m. on the same day.

Like the 1938 storm, the present hurricane has gained speed as it moved up the Atlantic seaboard. At 12 noon, Sept. 15, it was moving at about 30 miles an hour. Twenty-four hours later it had reached speeds approaching 50 miles an hour, when it neared Norfolk. The 1938 hurricane was moving at 60 miles an hour when it hit New England. It seems that hurricanes pick up speed as they progress northward.

After traversing Long Island, the center of the 1938 hurricane continued northward across western New England into Vermont, and then bore slightly to the west. It crossed the lower St. Lawrence Valley near Montreal and continued in a northwest direction until it was lost in the Arctic regions of Canada.

After striking Atlantic City and Asbury Park coastal communities, the present "full hurricane" continued northward through central Long Island, into eastern Connecticut, through Rhode Island and the Cape Cod area of Massachusetts. It veered past the coast of Maine and continued in a northeasterly direction.

Of the major hurricanes which have occurred in mid-September and which have cut a path up the Atlantic coast of the United States, none has followed the same path. The recent hurricane moved up the coast, touching Cape Hatteras, about 50 to 75 miles closer inland than the 1938 storm.

Science News Letter, September 23, 1944

ENGINEERING

Engines Are Made From Metals And Brains

➤ "ENGINES are made out of metals and brains," said Dr. Charles F. Kettering, vice-president of General Motors Corporation, at the meeting of the American Chemical Society in New York, "and what we want to do is put as much of the latter in as possible. When that is done we get the most and the cheapest power out of a pound of fuel."

Dr. Kettering discussed the effect of molecular structure of gasolines and fuels on the power and efficiency of internal combustion engines.

Definite limitations, he stated, are imposed on the fuel-plus-engine combination by the destructive combustion disturbance called knock. Although both fuel and engine are involved in knock, the power and efficiency of any one design of engine are dependent upon the extent to which the fuel used is free from knock.

The extent to which the fuel is free from knock is influenced by the addition of materials such as lead tetraethyl to the fuel, and still more importantly by even slight changes in the molecular structure of the fuel itself, or the way in which even the same number of atoms are linked together to form molecules.

Such studies of molecular structure, he continued, have shown that long thin molecules knock very badly, and short compact ones of the same weight only a little, and the difference may amount to several-fold changes in the potential power output of an engine using them.

Science News Letter, September 23, 1944

MEDICINE

Thrombin Is Now Issued To Soviet Soldiers

➤ THROMBIN has been found so successful in stopping bleeding in certain kinds of wounds that ampoules of the material are now included in Soviet soldiers' field service dressings, according to a report issued by the Soviet Scientists Anti-Fascist Committee.

Thrombin is a substance in blood which plays an important part in making blood clot when it is shed. The clot is a device by which the body tries to stop the flow.

When there is much blood flow, however, as in cases in which large veins or arteries are cut, the flow washes away the clots. In some cases, a tourniquet can be used to stop the bleeding. In other cases, such as wounds in which the liver is injured, it is impossible to stop the flow of blood by tourniquet methods.

In such cases, the flow of blood can be stopped in three to five seconds by applying to the wound a gauze pad soaked in thrombin, Prof. B. Kudryashev, a young Soviet surgeon, reports. The thrombin he uses is made from the serum of horse blood.

Science News Letter, September 23, 1944

INVENTION

Stripping Machine for Grass Seed Is Perfected

➤ A MACHINE for stripping ripe seed off standing grass stalks is the invention on which patent 2,351,412 was granted to E. M. Dowd and the late C. S. Johnston, both of Amarillo, Texas. For resodding eroded and denuded lands, seed of native grasses is usually most desirable. Since such grasses as a rule cannot be cut and threshed like grain, the most practicable way to get the seed is to pull comb-like instruments through it. This process, called stripping, is acomplished mechanically by the new machine.

Science News Letter, September 23, 1944

RCA

1919 1944

25 YEARS OF PROGRESS
IN
RADIO AND ELECTRONICS

From 1919 to 1944 . . . RCA has pioneered in the science of radio and electronics . . . from world-wide wireless to national network and international short-wave broadcasting . . . from electron tubes to electron microscopes and radiothermics . . . from television to radar.

Twenty-five years of service to the Nation and the public have made RCA a symbol of achievement and progress . . . it is a monogram of quality in radio-electronic instruments and dependability in communications throughout the world.

★ ★ ★

RADIO CORPORATION OF AMERICA

LEADS THE WAY . . in Radio . . Television . . Phonographs . . Records . . Tubes . . Electronics

Do You Know?

Red Cross *blood* donations, by July 1, had reached 8,500,000 pints.

The Chinese, hundreds of years ago, conceived the idea of *ball bearings* made of leather.

French Morocco, Africa, exports each year iris roots, leafy herbs, wild marjoram and rose leaves for use in *perfumes*.

Hydroxylin is a new low-cost *plastic* developed in a government laboratory as a general purpose material made from mill-run sawdust or chips.

Haiti is prohibiting the exportation of *mahogany* and other fine woods as a measure to guard against depletion of supply.

Chile is planning to establish *tung-tree* orchards to produce tung oil for domestic uses; tung orchards in neighboring Argentina are successful.

Quartz crystals, essential material that plays an important part in radio transmission and reception, were thought by ancients to be ice congealed by long exposure to severe cold into durable form.

Scientific, agricultural and many other documents are included in the 45,000 letters and writings of *Thomas Jefferson* that Princeton University is now editing and preparing for publication.

The *scales* of a fish, which it keeps through life, unless lost through injury, tell its age to an experienced fish biologist, who counts the annuli, much as dendrochronologists count tree rings.

The African giraffe-like *wild okapi* is included in the list of interesting animals known as "living fossils" because it is more nearly related to extinct forms than to the modern giraffe.

A wine company at St. Catherines, Ont., has converted to making *apple sirup* from windfalls and culls; the sugar content of the product will be 60% and it will be prepared as a table sirup or for use in cigarettes.

Radio-telephotos of embarkation activities to invade France, received by the War Department in Washington, were developed and copies made ready for distribution within four hours of the time they were sent.

GENERAL SCIENCE

Postwar Wars

After Hitler and Hirohito, mankind must still battle the unknown. Cancer is an enemy killing 400 every day; more killed in World War I by flu than by bullets.

➤ POSTWAR wars must still be fought by mankind, Dr. Harlow Shapley, director of Harvard College Observatory, declared in the annual Phi Beta Kappa address in Cleveland. They will be fought, not against the tyranny of known and tangible dictators like Hitler and Hirohito, but against the tyranny of the unknown, and if we are to win we must put into them effort and treasure comparable to the sacrifices we are making now.

Dr. Shapley was invited to deliver the lecture before Phi Beta Kappa, national honor society for scholars, because he is president of its sister organization, Sigma Xi, national honor society of research scientists. He titled his talk, "A Design For Fighting."

As specific examples of enemies to be attacked in the postwar wars, Dr. Shapley pointed out illnesses that age and kill men and women before their time. He indicated five as particularly evil: cancer, mental derangements, arthritis, and the diseases of the circulatory and respiratory systems. He stated that in one 10-month period 25 years ago four times as many Americans were killed by influenza as died in the whole of World War I. As against the 300 men killed per day during the critical stage of the Normandy invasion he cited 400 deaths a day from cancer in a war that never ends.

Exhausting and debilitating as are the after-effects of a shooting war, the speaker went on, they have no worse effects on nations then persisting illiteracy and low educational standards. Nor do people need to await an authoritarian suppression of "dangerous thoughts." A deadening cultural uniformity is one of the dangers inherent in the very unity which we are seeking as a means to peace.

Two contradictory and amazing situations exist in America at the present time, the speaker pointed out. One is the fact that Americans are profiting from the war both materially and in social and intellectual ways. The other is the fact that all Americans want the war to end as quickly as possible.

This seeming paradox, as Dr. Shapley saw it, is explained not only by our fears of what may happen as a consequence of continued fighting but by our innate antipathy to war as such.

"This antipathy," he said, "is a characteristic that has been slowly bred into man by centuries of ethical teaching. When he is rational, man almost instinctively believes that peace is good, war is evil and that peace is the concomitant of desired individual liberty and democratic society.

Science News Letter, September 23, 1944

STATISTICS

Industrial Research Has Grown Greatly in Past Years

➤ PRIVATE industry's appreciation of the importance of scientific research was held against a numerical yardstick by G. Edward Pendray, assistant to the president of the Westinghouse Electric & Manufacturing Company.

Before the first World War, Mr. Pendray stated, most of the scientific work of the country was done in university laboratories, and even in 1920 only 297 American companies had research laboratories of their own, employing about 7,400 scientists. By 1927, the number of laboratories had grown to 1,000, with staffs totaling about 19,000 employes.

In 1931 there were 1,520 industrial laboratories, staffed by 33,000; in 1938 there were 1,722, with 43,300 scientists; in 1940, 2,350 companies had laboratories, manned by 70,000 researchers. The prospects are for continued and accelerated growth.

Another encouraging tendency, in Mr. Pendray's opinion, has been the great increase in the lay public's interest in science, fed by plain-English accounts of new scientific discoveries and events which are prepared by a group of specialists in popular science writing. He appealed to this group to recruit new members for its ranks, so that the need for more and better science popularization can be met.

Science News Letter, September 23, 1944

Dairy cows should have one pound of grain for each 1½ to two quarts of milk produced.

WILDLIFE

NATURE RAMBLINGS

by Frank Thone

More Hunting This Fall

➤ BECAUSE all the heavy shooting has been concentrated in Europe, Asia and the Pacific islands, wild beasts and birds on our own continent have had a long holiday from being shot at. This has permitted ducks and geese, deer and turkey, and most other kinds of game birds and animals to increase greatly in numbers. Partly because of this increase in their natural food supply, partly because they themselves were not being hunted and trapped for fur, many predatory species like wolves, foxes and weasels have also multiplied.

This hunters' holiday has not been due primarily to the drawing off of a large section of our able-bodied male population into a more serious kind of shooting. Judging from the number of hunting licenses and duck stamps sold, there still seem to be plenty of potential shooters, particularly among men and boys outside military age limits, as well as among modern feminine followers of Diana. The real bottleneck has been a shortage in sporting ammunition, caused by severe restrictions placed by the War Production Board on its manufacture.

In the meantime, the rising tide of wildlife numbers has been causing some embarrassment to the Fish and Wildlife Service, which only a decade ago was having a hard fight to avert depletion of some species and even extinction of others. Now they are getting complaints from farmers whose grain is being devoured by ducks and whose chickens are being stolen by foxes, as well as from sheep and cattle ranchers who find wolves and coyotes becoming bolder as well as more numerous.

So the WPB is relaxing its ban on the production of ammunition, to permit the manufacture of 130,000,000 shotgun shells, 8,000,000 center-fire cartridges and 240,000,000 rim-fire cartridges—the latter, of course, being the younger shooters' favorite "twenty-twos." These, in the hands of the country's still large army of hunters, will probably bring about a reduction in some of the wildlife surpluses, with incidental benefits in additions to food and fur supplies.

According to the Fish and Wildlife Service, this fall will see a flight of wild ducks, favorite quarry of most shotgun sportsmen, such as has not been witnessed by this generation. A "guesstimate" figure of 150,000,000 ducks was set. Something like 130,000,000 ducks flew north to Canada and Alaska last spring, and the breeding season has been unusually favorable, so that such a cloud of dark wings is not at all unlikely.

Science News Letter, September 23, 1944

There are approximately 500,000 active cases of *tuberculosis* in the United States.

Chrysanthemums should be watered early enough in the day so that the foliage will dry off before night.

HER FUTURE . . . HER VISION . . . HIS SCIENCE

She stands on the threshold of useful life. Through her eyes and into her mind must come, in the next few years, the essence of accumulated wisdom of the ages. The mysterious and amazing things that today are vague dreams in research laboratories will be hers, to know and use.

The windows to her mind—through which must come most of what she learns—are her eyes. Faulty vision must not be allowed to handicap her learning ability, to retard her development. Fortunate indeed it is that skilled professional and technical men—ophthalmologists, optometrists and opticians—stand ready to give her vision the benefits of the exact techniques of modern optical science.

Skillful analysis of visual abilities, and correction, where necessary, of visual defects, are services of first-line importance to alert Americans, six or sixty. Only by consulting a qualified optometrist or ophthalmologist can you determine whether or not your vision is all that it can be—and should be.

BAUSCH & LOMB

OPTICAL CO., ROCHESTER, N. Y.

Makers of Optical Glass and a Complete Line of Optical Instruments for Military Use, Education, Research, Industry and Eyesight Correction and Conservation

POPULATION

Population Problem

Difficult adjustment awaits the postwar world, AAAS president warns. Finding places for refugees is only one aspect of the puzzle.

➤ SOME VERY tough problems in population adjustment await the planners of the postwar world, with crowded peoples wanting more room and the holders of apparently desirable living space unwilling to move over, Dr. Isaiah Bowman, president of the Johns Hopkins University, gave warning in his address as retiring president of the American Association for the Advancement of Science. In Dr. Bowman's absence, his address was read by Dr. F. R. Moulton, permanent secretary, AAAS.

Finding places where refugees may settle and begin a new life is only one aspect of the manifold problem, Dr. Bowman pointed out: taking care of huge surplus populations in lands like India and China, that now press upon available means for livelihood, often to the actual starvation point, is an even more difficult matter.

It can't be solved by the magic wand of simple migration into what appear to be empty territories. As a concrete example, the speaker took up the suggestion of transplanting India's annual increase of five millions into the Amazon basin. Transportation alone would present a simply impossible task; the bewildered migrants wouldn't know how to make a living in the strange new country; and the Brazilians might not like the idea of having a new Indian empire suddenly dumped among them.

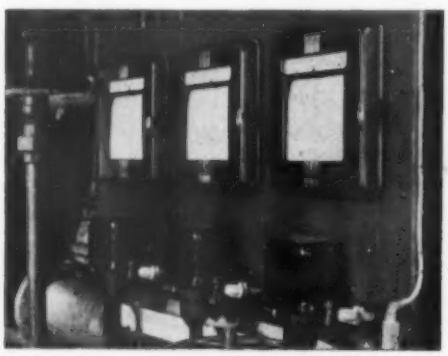
Or, as another concrete example: "Economic easement in China seems a far more rational solution than merely keeping Chinese out of Australia. If white settlement in Australia is urgent, it is equally urgent to begin the industrialization of China."

Many persons, looking at what seem to be blank spaces on the map, murmur "irrigation," as if that were a magic talisman. Naive notions that simply digging irrigation ditches will open up vast areas in Tanganyika Territory in Africa have been put forward even in Tanganyika itself. Yet the experience in our own irrigated West has shown that instead of the optimistically expected "homes for millions," 24 national irrigation projects had by 1926 provided for a total farm population of only 137,000.

One of the worst records in attempted population transfers was made by Italy in Libya, Dr. Bowman pointed out. For political reasons, the Fascist regime crowded the native nomad population away from some of its best pasture lands and encouraged families from Italy to undertake farming them. Yet these colonial farmers had to be most expensively sustained by all sorts of grants and special concessions from the home government. The farms never did pay, on a strictly economic basis.

To arrive at a real solution of the problems of population adjustment, by migration or otherwise, requires skilled and scientific research, not hopeful but hastily conceived experiments, Dr. Bowman indicated. The potentialities and drawbacks of each proposed settlement area must be thoroughly examined, as well as the social setup and mental dispositions of the two populations concerned.

Science News Letter, September 23, 1944



pH CONTROL SIMPLIFIED BY MICROMAX RECORDERS

Efficiency of water-treatment in the Arkwright Corporation's Finishing Division, Fall River, Mass., has been considerably improved since the former method of checking manually has been superseded by the three glass-electrode Micromax pH Recorders shown above. Now filter plant operators automatically obtain complete, accurate pH information starting with raw water which varies from 5 to 9 pH, including water at the alum-treatment point, and ending with finished water at 7 pH.

The instruments used are Strip-Chart Signalling Recorders . . . fully automatic; alarm operating. They record in great detail, on a range of 2-12 pH.

For further information, see Catalog N-96 (1).

LEEDS & NORTHRUP COMPANY, 4977 STENTON AVE., PHILA. 44, PA.
LEEDS & NORTHRUP

Jrl. Ad. N-96-701(2b)

CHEMISTRY

Key Weapons That Decide Victories

➤ CATALYSTS are the real key weapons that decide the course of wars, Prof. Hugh S. Taylor of Princeton University declared in his address as retiring vice president of the section on chemistry of the American Association for the Advancement of Science.

Chemists nearly won the first World War for the Kaiser because they had mastery of two catalytic processes, the utilization of coal tar in explosives and poison gases and the synthesis of nitrates out of the air, Prof. Taylor pointed out. Chemists are winning the second World War for the United Nations through their mastery of catalytic processes that give us an abundance of high explosives, hundred-octane gasoline, synthetic rubber, nylon and plastics.

A catalyst is a substance that promotes a chemical reaction without being directly involved or used up itself. Some catalysts, such as those that weld together the big molecules of synthetic rubber or nylon out of smaller molecules, are active in promoting unions—they are the marrying parsons of chemistry. Others, like those that split heavy petroleum molecules into the lighter ones of aviation gasoline, are specialists in taking things apart—they are the divorce lawyers. But the catalysts themselves remain chemical bachelors.

One of the great successes of recent catalytic chemistry, Prof. Taylor pointed out, has been the production of toluene from petroleum. Toluene is best known as the raw material for TNT—which is chemical shorthand for tri-nitro-toluene. During the first World War, toluene could be made only from coal tar, and cost more than a dollar a pound. Now, thanks to the catalytic cracking of petroleum it costs only a few cents a pound.

Besides being useful in a high explosive, toluene has great potential value in the production of super-gasolines, for which it will be available after military requirements are met. One grade of aviation fuel in which it is used has an octane rating of 125.

Science News Letter, September 23, 1944

Books of the Week

➤ ANIMALS on the run are always fascinating, just to watch. But they may be watched to some scientific purpose, as A. Brazier Howell well demonstrates in SPEED OF ANIMALS (Univ. of Chicago Press, $4). Giving most of his attention to mammals, but not neglecting the other vertebrates, Dr. Howell gives a most illuminating account not only of the animals in action but of the structural bases of that action. It is something new in the field of zoology, and as such all the more valuable.

Science News Letter, September 23, 1944

➤ GENERAL ROMMEL has disappeared from the news lately; perhaps his fate will never be known. He has left, among his writings, a book that soldiers and wartime civilians alike can read with interest and profit, the English translation of which, INFANTRY ATTACKS, has just become available. It consists principally of accounts of his own combat experiences in World War I (*Infantry Journal*, $3.)

Science News Letter, September 23, 1944

➤ GEOLOGISTS everywhere will welcome the appearance of the new edition of INDEX FOSSILS OF NORTH AMERICA, by Hervey W. Shimer and Robert R. Schrock (*Wiley*, $20). Originally issued by Grabau and Shimer in 1915, this book in its new appearance has undergone such extensive revision and had so many editions that it is virtually a new work. With alternating pages of beautifully clear illustrations and concise textual descriptions, covering thousands of species, it constitutes a powerful aid in identifying geological horizons, whether used in the field or in the laboratory.

Science News Letter, September 23, 1944

Just Off the Press

THE AMERICAN RIFLE FOR HUNTING AND TARGET SHOOTING—C. E. Hagie—*Macmillan*, 174 p., illus., $1.95.

ARCHEOLOGICAL REGIONS OF COLOMBIA: A Ceramic Survey—Wendell C. Bennett—*Yale Univ. Press*, 82 p., illus., paper, $2.50. Yale University Publications in Anthropology Number 30.

BUILDING SEX INTO YOUR LIFE—Paul Popenoe—*Am. Inst. of Family Relations*, 23 p., paper, 25c.

THE BUSINESS OF GETT'NG WELL—Marshall Sprague—*Crowell*, 143 p., illus., $1.75.

THE CADDIS FLIES, OR TRICHOPTERA, OF ILLINOIS—Herbert H. Ross—*State of Illinois*, 326 p., illus., paper, Bulletin of the Illinois Natural History Survey, Vol. 23, Article 1.

CHEMICAL ENGINEERING THERMODYNAMICS—Barnett F. Dodge—*McGraw*, 680 p., illus., $6.

RAYMOND L. DITMARS: His Exciting Career With Reptiles, Animals and Insects—L. N. Wood—*Messner*, 272 p., illus., $2.50.

ECONOMY IN THE USE OF DRUGS IN WARTIME—With an Appendix on Economy in the Use of Bactericides—*His Majesty's Stationery Office*, 16 p., paper, 3d. Medical Research Council, War Memorandum No. 3.

ELECTRICAL LIVING IN 194x—*Westinghouse*, 44 p., paper, 50 cents.

EPHRAIN'S INORGANIC CHEMISTRY—P. C. L. Thorne and E. R. Roberts—*Nordeman*, 921 p., illus., $8.75. Photo Offset Reprint.

FREUD'S CONTRIBUTION TO PSYCHIATRY—A. A. Brill—*Norton*, 244 p., $2.

EMPLOYEE COUNSELING: A Survey of a New Development in Personnel Relations—Helen Baker—*Princeton Univ.*, 64 p., paper, $1.

MANUAL OF MILITARY NEUROPSYCHIATRY—Harry C. Solomon—*Saunders*, 764 p., illus., $6.

QUICK FREEZING: A Digest of Authoritative Information on Quick Freezing of Foods for the Home—Anne Pierce—*Barrows*, 84 p., illus., $1.

TABLES OF REAGENTS FOR INORGANAC ANALYSIS—J. W. Edwards—*Alien Property Custodian*, 409 p., $11.25. Reprinted from the German edition.

Even Two Days
Without Adequate Protein

are apt to produce manifestations of hypoproteinemia, loss in circulating plasma protein, lassitude, and general debility.* Protein foods deserve priority, not only in the dietaries of illness, but in the normal diet as well. The proteins of meat are of highest biologic quality, the right kind for every protein need.

*"Investigations . . . have shown the importance of protein even during short periods of deprivation, and hence it probably deserves just as much priority as water, electrolytes and vitamins. . . ." (Elman, R.: The Importance of Giving Protein Priority in Restricted Diets, Editorial, Gastroenterology 2:360 [May] 1944). *"Two days of protein deprivation . . . lowers the blood protein definitely." (Cutting, W. C., and Cutter, R. D.: Effect of a Low Calorie, Low Protein Diet on Blood Proteins, Proc. Soc. Exper. Biol. & Med. 32: 1053 [April] 1935). *"During both series of observations, all four subjects complained of lassitude and a feeling of general debility during the third and fourth day of the protein deficient regimen." (Mueller, A. J.; Fickas, D., and Cox, W. M., Jr.: Minimum Maintenance Requirement of an Enzymic Casein Hydrolysate, Bull. Johns Hopkins Hosp. 72:110 [Feb.] 1943).

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

AMERICAN MEAT INSTITUTE

MAIN OFFICE, CHICAGO . . . MEMBERS THROUGHOUT THE UNITED STATES

•New Machines and Gadgets•

❁ *FOREST FIRE extinguisher, a bomb to be dropped from airplanes, upon hitting the ground scatters a suitable fire-extinguishing chemical on the fire and surrounding territory. A winged tail assembly causes the bomb to hit the surface on its detonating pin.*

Science News Letter, September 23, 1944

❁ *STEAM IRON for pressing clothes, in an improved form, flashes steam on the materials near the point of the iron through channels and ports that can be easily cleaned of deposits from impurities in the water. The construction also prevents particles of water from being carried by the steam to the clothes.*

Science News Letter, September 23, 1944

❁ *PRISMATIC lenses set in a light-weight plastic frame and eye shade, worn on the head over the wearer's glasses, constitute a binocular magnifier for the examination of specimens, cultures, crystals, seeds and other objects. The box frame shields the eyes on the sides and top.*

Science News Letter, September 23, 1944

❁ *KITCHEN knife sharpeners having roller disks are used to smooth the edges of warplane aluminum sheets in an aircraft factory. They are fitted with plastic handles and with V-shaped metal guards to protect the workers' fingers.*

Science News Letter, September 23, 1944

❁ *CONTINUOUSLY moving overhead chain-conveyor is employed in at least one aircraft factory to move heavy objects with dispatch and efficiency. A section of the chain and I-beam track are shown in the picture. Floor-type trucks*

and trailers are hooked onto the conveyor by telescopic masts.

Science News Letter, September 23, 1944

❁ *HYDRAULIC built-in jacks on automobiles mounted on the under side of the axles, one near each wheel, are power-operated from the car engine and permit one or more wheels to be raised from the ground as desired. All four jacks in this patented arrangement are connected to a common reservoir and valve housing.*

Science News Letter, September 23, 1944

❁ *POWER-DRIVEN oyster opener is a small hand tool with a chisel-like blade which vibrates rapidly in an endwise direction. The point, inserted between the half shells and driven in by the vibrations, cuts the holding muscle and pries the shells apart.*

Science News Letter, September 23, 1944

❁ *BEVERAGE CUP, with a hollow straight handle through which a sucking straw may be extended to the bottom of the mug, permits drinking the liquid contents without the froth or scum at the top. A crossarm connects cup and top of handle.*

Science News Letter, September 23, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 226.

BOOKS

SCIENCE NEWS LETTER will gladly obtain any American book or magazine in print for subscribers.

Send check or money order to cover regular retail price. If price is unknown, send $5 and change will be returned. We will pay postage in the United States.

When publications are free, send 10c for handling.

Book Department
SCIENCE NEWS LETTER
1719 N Street, N.W.
Washington 6, D.C.

Question Box

BACTERIOLOGY

How may germs become the means for more abundant living? p. 200.

ECONOMICS

How can full employment be attained after the war? p. 198.

ENGINEERING

How are tiny tools helping the war effort? p. 199.

GENERAL SCIENCE

On what does the future security of the United States depend? p. 198.

What will be the nature of our "postwar wars"? p. 204.

MEDICINE

What were the results of using penicillin for treating bone disease in rats? p. 195.

MILITARY SCIENCE

What is the latest accomplishment of grasshopper planes? p. 197.

METEROLOGY

How severe was the recent hurricane? p. 202.

NUTRITION

What nutritional quality should plant breeders work toward? p. 196.

POPULATION

What will be the population problem after the war? p. 206.

PUBLIC HEALTH

Where has polio started to decrease? p. 201.

STATISTICS

How much has industrial research grown in the past few years? p. 204.

Where published sources are used they are cited.

The imprint to the right is mailing address for your Science News Letter.

Date on lower line is expiration of your subscription.

Renew early to avoid lapse in service.

In requesting change of address please give your old address as well as the new one, at least two weeks before change is to become effective.